

CLAIMS

1. A file recording device for recording actual data in a recording medium as a file with a predetermined format,

5 wherein said file to which a plurality of said actual data can be assigned is formed of a management information block in which management information for managing said actual data is put together, and said actual data block;

wherein said management information block is further
10 divided into blocks by a hierarchical structure, the middle-level hierarchical management information block corresponding to said actual data is formed for each said actual data, and the corresponding information necessary for reproducing said actual data is set to a low-level

15 hierarchical block of said middle-level hierarchical management information block;

and wherein said file recording device assigns a stream in which video data serving as a stream and sound data serving as a stream are multiplexed to one piece of said
20 actual data to form said actual data block, forms said middle-level hierarchical management information block corresponding to said multiplexed stream, sets information necessary for reproducing said multiplexed stream, information necessary for reproducing said video data
25 serving as said stream, and information necessary for

reproducing said sound data serving as said stream to the
low-level hierarchical block of the middle-level
hierarchical management information block, and records said
multiplexed stream in said recording medium as a file with
5 said format.

2. The file recording device according to Claim 1,
wherein information necessary for reproducing said
multiplexed stream, information necessary for reproducing
10 said video data serving as said stream, and information
necessary for reproducing said sound data serving as said
stream are set to said low-level hierarchical block as the
extended data of said low-level hierarchical block.

15 3. The file recording device according to Claim 2,
wherein the information necessary for reproducing said
multiplexed stream is separated into system information
relating to basic information, and system auxiliary
information relating to auxiliary information, which are set
20 to said low-level hierarchical block as each entry
respectively.

4. The file recording device according to Claim 1,
wherein identification information, which indicates whether
25 said video data serving as said stream is data which has

been subjected to encoding processing using closed GOP, or data which has been subjected to encoding processing using open GOP, is set to said low-level hierarchical block.

5 5. The file recording device according to Claim 1, wherein priority information which indicates the priority at the time of reproduction regarding each stream making up said corresponding multiplexed stream is set to said middle-level hierarchical management information block.

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6. The file recording device according to Claim 5, wherein priority information which indicates the priority at the time of reproducing the corresponding actual data is set for each said actual data.

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7. The file recording device according to Claim 1, wherein control information for controlling each stream making up said multiplexed stream is assigned to said actual data block as one piece of actual data, and the middle-level
20 hierarchical management information block corresponding to said control information is set.

8. The file recording device according to Claim 7, wherein said control information is information which
25 instructs output or non-output of reproduction results

regarding each of said respective streams.

9. A file reproducing device for reproducing and outputting a file recorded in a predetermined recording medium, wherein said file to which a plurality of said actual data can be assigned is formed of a management information block in which management information for managing said actual data is put together, and said actual data block;

10 wherein said management information block is further divided into blocks by a hierarchical structure, the middle-level hierarchical management information block corresponding to said actual data is formed for each said actual data, the corresponding information necessary for reproducing said actual data is set to a low-level hierarchical block of said middle-level hierarchical management information block, a stream in which video data serving as a stream and sound data serving as a stream are multiplexed is assigned to one piece of said actual data to form said actual data block, said middle-level hierarchical management information block corresponding to said multiplexed stream is formed, information necessary for reproducing said multiplexed stream, information necessary for reproducing said video data serving as said stream, and 25 information necessary for reproducing said sound data

serving as said stream are set to the low-level hierarchical block of the middle-level hierarchical management information block;

and wherein said file reproducing device processes the data of said file to be reproduced from said recording medium based on said information necessary for reproduction set to said low-level hierarchical block to reproduce said video data serving as said stream and said sound data serving as said stream.

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10. The file reproducing device according to Claim 9, wherein a file having difficulty in reproduction is detected based on said information necessary for reproduction set to said low-level hierarchical block.

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11. The file reproducing device according to Claim 9, wherein the processing relating to said multiplexed stream is switched based on the identification information set to said low-level hierarchical block, which indicates whether said video data serving as said stream is data which has been subjected to encoding processing using closed GOP, or data which has been subjected to encoding processing using open GOP.

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12. The file reproducing device according to Claim 9,

wherein determination is made regarding whether or not the file is reproducible based on the identification information set to said low-level hierarchical block, which indicates whether said video data serving as said stream is data which has been subjected to encoding processing using closed GOP, or data which has been subjected to encoding processing using open GOP.

13. The file reproducing device according to Claim 9, wherein a stream to be reproduced is selected based on the priority information set to said middle-level hierarchical management information block, which indicates the priority at the time of reproduction regarding each stream making up said corresponding multiplexed stream.

14. The file reproducing device according to Claim 9, wherein based on the priority information set to said middle-level hierarchical management information block, which indicates the priority at the time of reproduction regarding each stream making up said corresponding multiplexed stream, said stream is subjected to mixing.

15. The file reproducing device according to Claim 9, wherein based on the control information to be provided in said actual data block, which controls each stream making up

said multiplexed stream, reproduction of said corresponding stream is controlled.

16. The file reproducing device according to Claim 15,
5 wherein control of reproduction of said corresponding stream is control of output or non-output of reproduction results.

17. A file editing device for editing a file with a predetermined format, wherein said file to which a plurality
10 of said actual data can be assigned is formed of a management information block in which management information for managing said actual data is put together, and said actual data block;

wherein said management information block is further
15 divided into blocks by a hierarchical structure, the middle-level hierarchical management information block corresponding to said actual data is formed for each said actual data, the corresponding information necessary for reproducing said actual data is set to a low-level
20 hierarchical block of said middle-level hierarchical management information block, a stream in which video data serving as a stream and sound data serving as a stream are multiplexed is assigned to one piece of said actual data to form said actual data block, said middle-level hierarchical
25 management information block corresponding to said

multiplexed stream is formed, information necessary for reproducing said multiplexed stream, information necessary for reproducing said video data serving as said stream, and information necessary for reproducing said sound data

5 serving as said stream are set to the low-level hierarchical block of the middle-level hierarchical management information block;

and wherein said file editing device processes said file based on said information necessary for reproduction
10 set to said low-level hierarchical block.

18. The file editing device according to Claim 17, wherein determination is made regarding whether or not said file is editable based on said information necessary for
15 reproduction set to said low-level hierarchical block.

19. The file editing device according to Claim 17, wherein the processing relating to said multiplexed stream is switched based on the identification information set to
20 said low-level hierarchical block, which indicates whether said video data serving as said stream is data which has been subjected to encoding processing using closed GOP, or data which has been subjected to encoding processing using open GOP.

20. The file editing device according to Claim 17,
wherein determination is made regarding whether or not the
file can be processed based on the identification
information set to said low-level hierarchical block, which
5 indicates whether said video data serving as said stream is
data which has been subjected to encoding processing using
closed GOP, or data which has been subjected to encoding
processing using open GOP.

10 21. The file editing device according to Claim 17,
wherein priority information which indicates the priority at
the time of reproduction regarding each stream making up
said corresponding multiplexed stream is set to said middle-
level hierarchical management information block depending on
15 the settings by a user.

22. The file editing device according to Claim 17,
wherein control information for controlling each stream
making up said multiplexed stream is set to said actual data
20 depending on the settings by a user.

23. A file recording method for recording actual data in
a recording medium as a file with a predetermined format,
wherein said file to which a plurality of said actual data
25 can be assigned is formed of a management information block

in which management information for managing said actual data is put together, and said actual data block;

wherein said management information block is further divided into blocks by a hierarchical structure, the middle-

5 level hierarchical management information block

corresponding to said actual data is formed for each said actual data, and the corresponding information necessary for reproducing said actual data is set to a low-level

hierarchical block of said middle-level hierarchical

10 management information block;

and wherein said file recording method assigns a stream in which video data serving as a stream and sound data serving as a stream are multiplexed to one piece of said actual data to form said actual data block, forms said

15 middle-level hierarchical management information block

corresponding to said multiplexed stream, sets information necessary for reproducing said multiplexed stream,

information necessary for reproducing said video data

serving as said stream, and information necessary for

20 reproducing said sound data serving as said stream to the

low-level hierarchical block of the middle-level

hierarchical management information block, and records said

multiplexed stream in said recording medium as a file with said format.

24. The file recording method according to Claim 23,
wherein identification information, which indicates whether
said video data serving as said stream is data which has
been subjected to encoding processing using closed GOP, or
5 data which has been subjected to encoding processing using
open GOP, is set to said low-level hierarchical block.

25. The file recording method according to Claim 23,
wherein priority information which indicates the priority at
10 the time of reproduction regarding each stream making up
said corresponding multiplexed stream is set to said middle-
level hierarchical management information block.

26. The file recording method according to Claim 23,
15 wherein control information for controlling each stream
making up said multiplexed stream is assigned to said actual
data block as one piece of actual data, and the middle-level
hierarchical management information block corresponding to
said control information is set.

20 27. A file reproducing method for reproducing and
outputting a file recorded in a predetermined recording
medium, wherein said file to which a plurality of said
actual data can be assigned is formed of a management
25 information block in which management information for

managing said actual data is put together, and said actual data block;

wherein said management information block is further divided into blocks by a hierarchical structure, the middle-level hierarchical management information block
5 corresponding to said actual data is formed for each said actual data, the corresponding information necessary for reproducing said actual data is set to a low-level hierarchical block of said middle-level hierarchical
10 management information block, a stream in which video data serving as a stream and sound data serving as a stream are multiplexed is assigned to one piece of said actual data to form said actual data block, said middle-level hierarchical management information block corresponding to said
15 multiplexed stream is formed, information necessary for reproducing said multiplexed stream, information necessary for reproducing said video data serving as said stream, and information necessary for reproducing said sound data serving as said stream are set to the low-level hierarchical
20 block of the middle-level hierarchical management information block;

and wherein said file reproducing method processes the data of said file to be reproduced from said recording medium based on said information necessary for reproduction
25 set to said low-level hierarchical block to reproduce said

video data serving as said stream and said sound data
serving as said stream.

28. The file reproducing method according to Claim 27,
5 wherein the processing relating to said multiplexed stream
is switched based on the identification information set to
said low-level hierarchical block, which indicates whether
said video data serving as said stream is data which has
been subjected to encoding processing using closed GOP, or
10 data which has been subjected to encoding processing using
open GOP.

29. The file reproducing method according to Claim 27,
wherein a stream to be reproduced is selected based on the
15 priority information set to said middle-level hierarchical
management information block, which indicates the priority
at the time of reproduction regarding each stream making up
said corresponding multiplexed stream.

20 30. The file reproducing method according to Claim 27,
wherein based on the control information to be provided in
said actual data block, which controls each stream making up
said multiplexed stream, reproduction of said corresponding
stream is controlled.

31. A file editing method for editing a file with a predetermined format, wherein said file to which a plurality of said actual data can be assigned is formed of a management information block in which management information
5 for managing said actual data is put together, and said actual data block;

wherein said management information block is further divided into blocks by a hierarchical structure, the middle-level hierarchical management information block

10 corresponding to said actual data is formed for each said actual data, the corresponding information necessary for reproducing said actual data is set to a low-level hierarchical block of said middle-level hierarchical management information block, a stream in which video data
15 serving as a stream and sound data serving as a stream are multiplexed is assigned to one piece of said actual data to form said actual data block, said middle-level hierarchical management information block corresponding to said multiplexed stream is formed, information necessary for
20 reproducing said multiplexed stream, information necessary for reproducing said video data serving as said stream, and information necessary for reproducing said sound data serving as said stream are set to the low-level hierarchical block of the middle-level hierarchical management
25 information block;

and wherein said file editing method processes said file based on said information necessary for reproduction set to said low-level hierarchical block.

5 32. The file editing method according to Claim 31,
wherein the processing relating to said multiplexed stream
is switched based on the identification information set to
said low-level hierarchical block, which indicates whether
said video data serving as said stream is data which has
10 been subjected to encoding processing using closed GOP, or
data which has been subjected to encoding processing using
open GOP.

33. The file editing method according to Claim 31,
15 wherein priority information which indicates the priority at
the time of reproduction regarding each stream making up
said corresponding multiplexed stream is set to said middle-
level hierarchical management information block depending on
the settings by a user.

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34. The file editing method according to Claim 31,
wherein control information for controlling each stream
making up said multiplexed stream is set to said actual data
depending on the settings by a user.

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35. A program regarding a file recording method for recording actual data in a recording medium as a file with a predetermined format, wherein said file to which a plurality of said actual data can be assigned is formed of a

5 management information block in which management information for managing said actual data is put together, and said actual data block;

and wherein said management information block is further divided into blocks by a hierarchical structure, the
10 middle-level hierarchical management information block corresponding to said actual data is formed for each said actual data, and the corresponding information necessary for reproducing said actual data is set to a low-level hierarchical block of said middle-level hierarchical
15 management information block;

said program regarding a file recording method comprising:

a step for assigning a stream in which video data serving as a stream and sound data serving as a stream are
20 multiplexed to one piece of said actual data to form said actual data block; and

a step for forming said middle-level hierarchical management information block corresponding to said multiplexed stream, and also setting information necessary
25 for reproducing said multiplexed stream, information

necessary for reproducing said video data serving as said stream, and information necessary for reproducing said sound data serving as said stream to the low-level hierarchical block of the middle-level hierarchical management

5 information block.

36. A program regarding a file reproducing method for reproducing and outputting a file recorded in a predetermined recording medium, wherein said file to which a plurality of said actual data can be assigned is formed of a management information block in which management information for managing said actual data is put together, and said actual data block;

wherein said management information block is further divided into blocks by a hierarchical structure, the middle-level hierarchical management information block corresponding to said actual data is formed for each said actual data, the corresponding information necessary for reproducing said actual data is set to a low-level hierarchical block of said middle-level hierarchical management information block, a stream in which video data serving as a stream and sound data serving as a stream are multiplexed is assigned to one piece of said actual data to form said actual data block, said middle-level hierarchical management information block corresponding to said

multiplexed stream is formed, information necessary for reproducing said multiplexed stream, information necessary for reproducing said video data serving as said stream, and information necessary for reproducing said sound data

5 serving as said stream are set to the low-level hierarchical block of the middle-level hierarchical management information block;

 and wherein said program regarding a file reproducing method comprises a step for processing the data of said file
10 to be reproduced from said recording medium based on said information necessary for reproduction set to said low-level hierarchical block to reproduce said video data serving as said stream and said sound data serving as said stream.

15 37. A program regarding a file editing method for editing a file with a predetermined format, wherein said file to which a plurality of said actual data can be assigned is formed of a management information block in which management information for managing said actual data is put together,
20 and said actual data block;

 wherein said management information block is further divided into blocks by a hierarchical structure, the middle-level hierarchical management information block corresponding to said actual data is formed for each said
25 actual data, the corresponding information necessary for

reproducing said actual data is set to a low-level hierarchical block of said middle-level hierarchical management information block, a stream in which video data serving as a stream and sound data serving as a stream are multiplexed is assigned to one piece of said actual data to form said actual data block, said middle-level hierarchical management information block corresponding to said multiplexed stream is formed, information necessary for reproducing said multiplexed stream, information necessary for reproducing said video data serving as said stream, and information necessary for reproducing said sound data serving as said stream are set to the low-level hierarchical block of the middle-level hierarchical management information block;

and wherein said program regarding a file editing method comprises a step for processing said file based on said information necessary for reproduction set to said low-level hierarchical block.

38. A recording medium storing a program regarding a file recording method for recording actual data in a recording medium as a file with a predetermined format, wherein said file to which a plurality of said actual data can be assigned is formed of a management information block in which management information for managing said actual data

is put together, and said actual data block;

and wherein said management information block is further divided into blocks by a hierarchical structure, the middle-level hierarchical management information block

5 corresponding to said actual data is formed for each said actual data, and the corresponding information necessary for reproducing said actual data is set to a low-level hierarchical block of said middle-level hierarchical management information block;

10 said program regarding a file recording method comprising:

a step for assigning a stream in which video data serving as a stream and sound data serving as a stream are multiplexed to one piece of said actual data to form said

15 actual data block; and

a step for forming said middle-level hierarchical management information block corresponding to said multiplexed stream, and also setting information necessary for reproducing said multiplexed stream, information

20 necessary for reproducing said video data serving as said stream, and information necessary for reproducing said sound data serving as said stream to the low-level hierarchical block of the middle-level hierarchical management information block.

39. A recording medium recording a program regarding a file reproducing method for reproducing and outputting a file recorded in a predetermined recording medium, wherein said file to which a plurality of said actual data can be assigned is formed of a management information block in which management information for managing said actual data is put together, and said actual data block;

wherein said management information block is further divided into blocks by a hierarchical structure, the middle-level hierarchical management information block corresponding to said actual data is formed for each said actual data, the corresponding information necessary for reproducing said actual data is set to a low-level hierarchical block of said middle-level hierarchical management information block, a stream in which video data serving as a stream and sound data serving as a stream are multiplexed is assigned to one piece of said actual data to form said actual data block, said middle-level hierarchical management information block corresponding to said multiplexed stream is formed, information necessary for reproducing said multiplexed stream, information necessary for reproducing said video data serving as said stream, and information necessary for reproducing said sound data serving as said stream are set to the low-level hierarchical block of the middle-level hierarchical management

information block;

and wherein said program regarding a file reproducing method comprises a step for processing the data of said file to be reproduced from said recording medium based on said
5 information necessary for reproduction set to said low-level hierarchical block to reproduce said video data serving as said stream and said sound data serving as said stream.

40. A recoding medium recording a program regarding a
10 file editing method for editing a file with a predetermined format, wherein said file to which a plurality of said actual data can be assigned is formed of a management information block in which management information for managing said actual data is put together, and said actual
15 data block;

wherein said management information block is further divided into blocks by a hierarchical structure, the middle-level hierarchical management information block
corresponding to said actual data is formed for each said
20 actual data, the corresponding information necessary for reproducing said actual data is set to a low-level hierarchical block of said middle-level hierarchical management information block, a stream in which video data serving as a stream and sound data serving as a stream are
25 multiplexed is assigned to one piece of said actual data to

form said actual data block, said middle-level hierarchical management information block corresponding to said multiplexed stream is formed, information necessary for reproducing said multiplexed stream, information necessary for reproducing said video data serving as said stream, and information necessary for reproducing said sound data serving as said stream are set to the low-level hierarchical block of the middle-level hierarchical management information block;

and wherein said program regarding a file editing method comprises a step for processing said file based on said information necessary for reproduction set to said low-level hierarchical block.

41. A recording medium recording a file with a predetermined format, wherein said file to which a plurality of said actual data can be assigned is formed of a management information block in which management information for managing said actual data is put together, and said actual data block;

and wherein said management information block is further divided into blocks by a hierarchical structure, the middle-level hierarchical management information block corresponding to said actual data is formed for each said actual data, the corresponding information necessary for

reproducing said actual data is set to a low-level hierarchical block of said middle-level hierarchical management information block, a stream in which video data serving as a stream and sound data serving as a stream are multiplexed is assigned to one piece of said actual data to form said actual data block, said middle-level hierarchical management information block corresponding to said multiplexed stream is formed, information necessary for reproducing said multiplexed stream, information necessary for reproducing said video data serving as said stream, and information necessary for reproducing said sound data serving as said stream are set to the low-level hierarchical block of the middle-level hierarchical management information block.